

REMARKS/ARGUMENTS

Claims 1-2, 4-8, and 10-40 are resubmitted. Claim 39 is currently amended. Claims 3, 9, 41, and 42 were previously canceled. No new claims have been added.

Claim 39 has been rejected under 35 USC 103(a) as being unpatentable over Rao et al., U.S. 2003/0142014 A1 ("Rao") in view of Ergene et al, U.S. Patent No. 6,812,807, ("Ergene"). Claims 1-2, 4-8, 10-38 and 40 are allowed.

Correction Notices

On page 2 of the Office Action, the Examiner makes a reference to a Takahashi patent in the 35 USC 103(a) rejection. However, there is no other reference to a Takahashi patent and no such patent is cited in the Notice of References Cited. Applicants regard this as a typographical error and have ignored this reference. Applicants respectfully request that the Examiner inform Applicants if this is not a typographical error.

Further, the Examiner makes no reference to claim 40 in the body of the Office Action. Claim 40 depends from independent claim 34, which has been objected to but containing allowable subject matter. Applicants regard this as a typographical error and will assume for the purposes of this Amendment and Response that claim 40 (like claims 1-2, 4-8, 10-38) has been allowed.

Also, the Examiner states on page 3 of the Office Action that claims 3 and 9 have been allowed. Claims 3 and 9 have previously been cancelled. Applicants regard this as a typographical error and will assume for the purposes of this Amendment and Response that claims 3 and 9 are cancelled and not currently under consideration.

Rao

Claim 39 has been rejected under 35 USC 103(a) as being unpatentable over Rao in view of Ergene. Claim 39 has been amended to overcome this rejection.

Rao discloses a dual-band multiple beam antenna system for a communications satellite sharing a set of reflector antennas for the transmit and receive frequencies. One set of reflectors is common to both the downlink and uplink frequencies. The feed horns are diplexed and exhibit frequency-dependent radiation patterns that separate the phase centers over the downlink and uplink frequency bands to obtain dual-band performance. The focal point of the reflector is in close proximity to the phase center corresponding to the downlink frequency band. The phase center for the uplink frequency band is spaced a predetermined distance from the phase center of the downlink frequency band. The uplink frequencies are defocused and the downlink frequencies are focused thereby creating identical radiation patterns at both frequency bands and over the coverage region of the communications satellite.

Rao, however, does not disclose forming a plurality of congruent multi-band beams having at least three frequency bands and forming a circularly polarized beam using an OMT/polarizer that provides dual-circular polarization capability at each of the at least three frequency bands, wherein a lowest frequency band is formed in a focused mode, a higher frequency band is formed in a defocused mode and a highest frequency band is formed in a defocused mode, as claimed in amended claim 39. Further, the system disclosed by Rao is limited compared to the present invention as claimed by claim 39 (as amended) in the sense that Rao's system can not provide congruent multiple spot beams over more than two frequency bands and hence

is limited to a single satellite service. The present invention as claimed by claim 39 further differs from the teachings of Rao in that the feed array of the present invention can use only a single reflector instead of requiring four reflectors and provides multiple beams over three or more frequency bands.

Ergene

Ergene discloses an antenna feed system comprising a single horn having corrugations and four evenly spaced waveguide ports on sides of a single one of the corrugations. A combiner network receives signals at approximately 20 GHz from the four waveguide ports and outputs sum and difference output signals. A transducer provides transmit signals at approximately 30 GHz and approximately 44 GHz to a rear end of the single horn.

Ergene, however, does not disclose forming a plurality of multi-band beams having at least three frequency bands and forming a circularly polarized beam using an OMT/polarizer that provides dual-circular polarization capability at each of the at least three frequency bands, wherein a lowest frequency band is formed in a focused mode, a higher frequency band is formed in a defocused mode and a highest frequency band is formed in a defocused mode, as claimed in amended claim 39. Therefore, Applicants submit that the present invention as claimed by claim 39 (as amended) is not unpatentable under Rao in view of Ergene and that the rejection under 35 USC 103(a) should be withdrawn.

CONCLUSION

Applicants would like to thank the Examiner for the notice of allowable subject matter. Reconsideration and withdrawal of the Office Action with respect to claim 39 is requested. All other pending claims have been allowed. Applicant respectfully requests that a timely Notice of Allowance of all pending claims be issued in this case.

In the event the examiner wishes to discuss any aspect of this response, please contact the attorney at the telephone number identified below.

Respectfully submitted,

By: David Bowls
David Bowls, Reg. No. 39,915
Michael A. Shimokaji, Reg. No. 32,303

SHIMOKAJI & ASSOCIATES, P.C.
8911 Research Drive
Irvine, CA 92618
(949) 788-9961

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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David Bowls
David Bowls, Reg. No. 39,915
Michael A. Shimokaji, Reg. No. 32,303